

Notice of Allowability	Application No.	Applicant(s)	
	09/578,038	YABE, TOMOYOSHI	
	Examiner	Art Unit	
	Virginia M Kibler	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed on 24 June 2004.
2. ☒ The allowed claim(s) is/are 1 and 11 (renumbered 1 and 2).
3. ☒ The drawings filed on 25 May 2000 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

MEHRDAD DASTOURI
PRIMARY EXAMINER

Mehrdad Dastouri

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Kerry H. Owens (Reg. No. 37,412) on 9/16/04.

The application has been amended as follows:

In the claims:

1. (Currently Amended) A surface inspection system for work boards passing through a plurality of manufacturing processes being transferred by a transferring roller, comprising:
 - a detecting means for detecting entry and exit of each work board into and out of each manufacturing process;
 - a time-measuring means for measuring times when the entry and exit of each work board are detected by said detecting means;
 - a determining means for determining whether each work board exits out of each manufacturing process at a scheduled exit time calculated based on the entry time measured by said time-measuring means;

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line sensors for one dimensionally imaging acquiring image data related to colors of an elongated work board having exited out of each manufacturing process in lines perpendicular to the moving direction of the work board, each line sensor comprising two types of image data sampling means, one for an odd-number sampling line and the other for an even-number sampling line;

a velocity-measuring means for measuring in real time the rotational velocity of the transferring roller on each data sampling position of the line sensor;

a sampling control means for controlling timing of the image data sampling of said line sensor in the direction of board movement and on the basis of the moving velocity of the work board measured by said velocity-measuring means;

an image-composing memory for forming a two-dimensional image of the work board by sequentially combining odd line data and even-line data from the line sensor;

a controlling means to correct the image data based on degree of slant of the work board;

an identifying means for identifying the work board and the image data thereof based on a process number representing each manufacturing process, and on times of entry and exit of the work board into and out of the process measured by said time-measuring means; and

a transmitting means for assigning each work board its own transmission channel for sequentially transmitting images of the board on each manufacturing process, assembling said image data into a transmission packet and transmitting said transmission packet.

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11. (Currently Amended) A surface inspection system as in claim 1, wherein slant correction is accomplished by an affine transformation based on the angle of slant as determined by the following equation:

$$\theta = \cos^{-1} (A_0 / A')$$

wherein θ equals the angle of slant, A_0 equals the number of pixels corresponding to the width of the work board and A' equals the number of pixels forming the board on the data sampling line.

REASONS FOR ALLOWANCE

2. The following is an examiner's statement of reasons for allowance: the instant invention replaces the known automatic inspection of the surface of work boards passing through a plurality of manufacturing processes. Conventionally, an inspection process of individual boards is usually performed at the final stage of manufacturing process so as to perform the inspection on the finished product. However, this can result in defective boards being continuously produced in large quantities. The essential difference from the prior art is that the instant invention enables one to trace and inspect the external appearance of work boards on a continuous work line after undergoing each manufacturing process. The inspection system is capable of identifying each individual work board and recording the manufacturing conditions of the individual work board. A transmission channel is assigned to every work board and image data is assembled into packets so as to transmit them, thereby making it possible to effectively transmit the image data without causing a collision between many packets of data. Therefore,

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the instant invention distinguishes an individual work board so that it is possible to accurately grasp the position of an individual work board relative to the manufacturing process. Even if a defect is found after the delivery of the finished board, the manufacturing conditions thereof can be traced in detail, since it is possible to find out the accurate time when the defective product was being moved through any one of the manufacturing processes. These features in combination with the other elements of the claims are not disclosed or suggested by the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

CONTACT INFORMATION

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Virginia M Kibler whose telephone number is (703) 306-4072. The examiner can normally be reached on Mon-Thurs 8:00 - 5:30 and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Virginia Kibler can be reached on (703) 308-4072. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Virginia Kibler

Virginia Kibler
09/16/04

MEHRDAD DASTOURI
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Mehrdad Dastouri